Integrated Pest Management for Nuisance Flies in Poultry and Dairy

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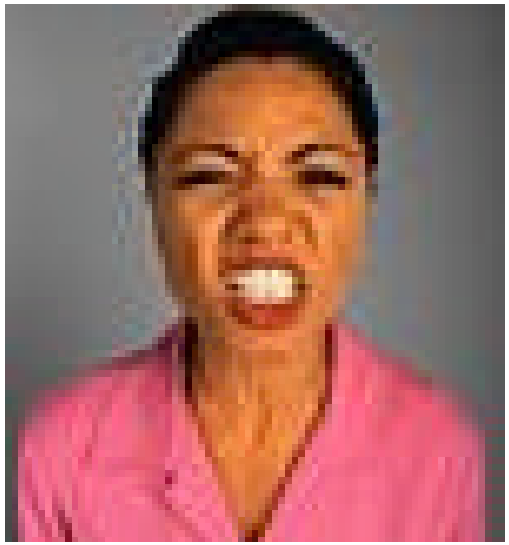
Flies

- Reduce profits
- Unpleasant work environment
- Health risk
- Unhappy neighbors



Integrated Pest Management

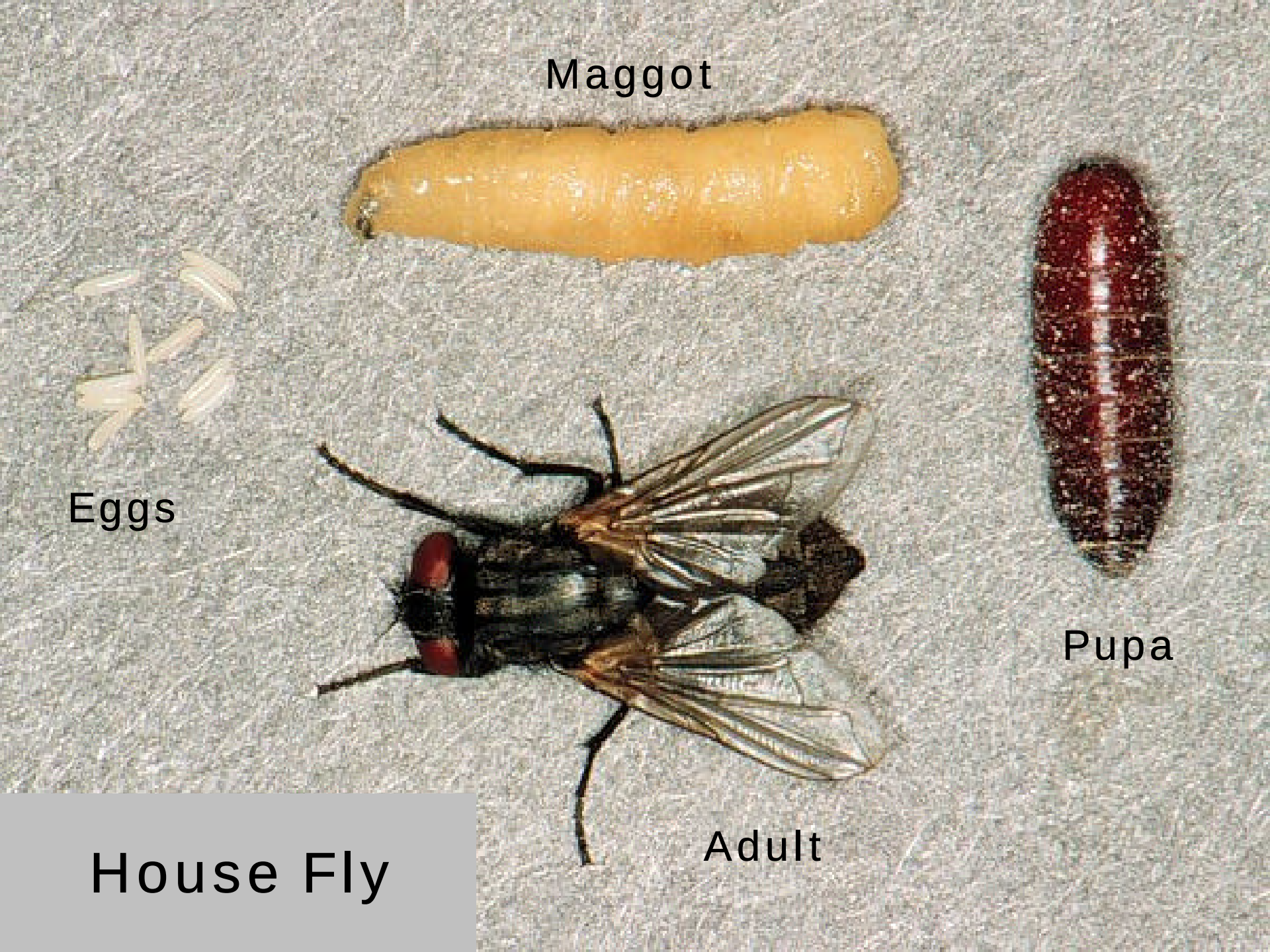
- Common-sense approach
  - Deny pests food, water, shelter
- Part of entire production & management scheme
- Benefits
  - Long-term effectiveness
  - Lower costs
  - Reduced health risks

IPM is:

- ID the pest
- Monitoring & Record-keeping
- Combination of Practices
  - Cultural (manure, feed, and moisture management)
  - Physical (traps, heat, cold, swatter)
  - Biological (natural enemies)
  - Chemical (pesticides)
- Regular Evaluation ($, effectiveness)

Know your Enemies

- House Fly
- Blow (Bottle) Flies
- Stable Fly



House Fly

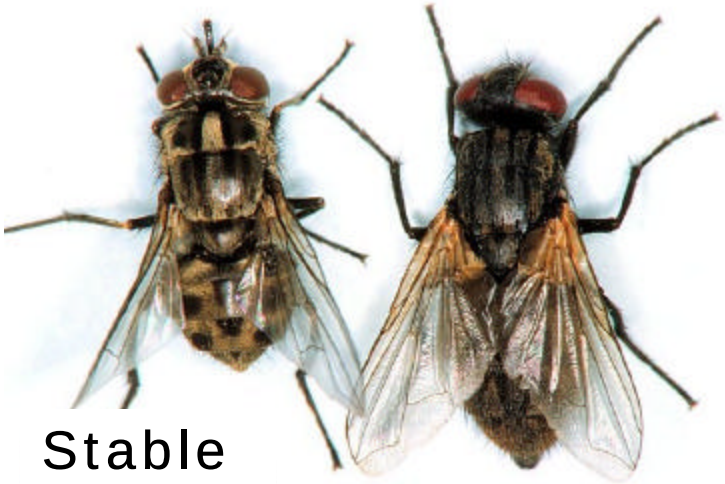
House Fly Managemen

Feeds and breeds in *moist* organic material

- manure
- feed
- broken eggs
- decaying vegetation

Stable Fly

- Adult is blood-feeder
- Attack mammals (cattle, horses, people, etc.), not birds
- Breeds in *wet* straw & manure, spilled feed, silage, decaying vegetation



Stable Fly

House Fly

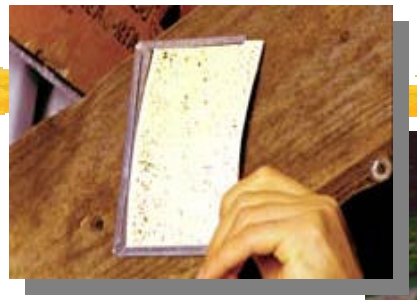
Blow Flies (Bottle Flies)

- Metallic green or blue-colored
- Slightly larger than housefly
- Breed on dead animals & birds, broken eggs, wet decaying organic matter

Keys to Successful Fly Management

1) Sanitation first
   - Use good manure management
   - Keep stalls, pens, floors clean and dry
   - Clean up spilled or wet feed promptly
   - Inspect and repair water leaks
   - Install and maintain proper drainage
   - Remove dead animals and birds promptly

2. Monitor, Keep Records, Evaluate Regularly



- Monitor:
  - speck counts (3x5 cards or tape)
  - bait trap count
- Keep Records
  - pesticides (where, when, what, rate, how)
  - fly or speck counts

3. Use Multiple Tactics

- Traps

Odor Attraction Traps

Sticky Traps

UV Light Traps

Chemical control

- Baits
- Space Sprays
  - eg. pyrethrins
- Residual Sprays
  - not generally recommended
- Feed Additives
  - eg. Larvidex

Milk Jug Bait Station

Insecticide Baits

Granular Bait

Granular Bait Station

Insecticide Bait Strip

Biological Control: use natural enemies

- Predators
  - Beetles, mites, wasps
- Parasitic wasps

Biological Control

- Conserve
  - Limit pesticide use
  - Pyrethrins & baits softer on beneficials
  - Trap and re-release predator beetles & mites
- Purchase and release natural enemies
  - Fly parasitic wasps
  - Fly predator beetles (Hister beetles)

Hister Beetle

- Adult: 1/8th” long, oval, shiny black
- Larvae: white, wormlike
- Eat fly eggs and sm. maggots in surface layers of manure (esp. poultry)
- Can be purchased, conserved, or trapped and re-released

Predatory Mites

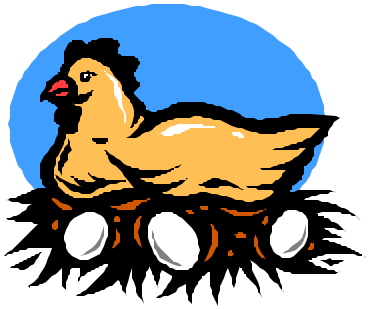
- 1/16” red-brown
- eat fly eggs and sm. maggots
- conserve by reducing pesticide use,
- In poultry barns: leave some manure in barn at clean-out or capture and re-release with ‘Hister Houses’

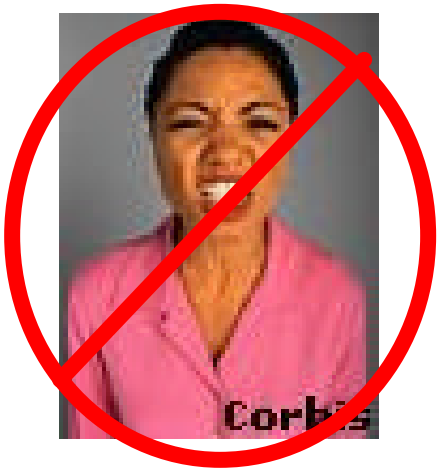
Parasitic Wasps

- Adults: dk. brown-black, 1/16-1/8”, lay eggs inside fly pupa
- Larva: worm-like, lives inside of fly pupa
- *Muscidifurax raptor* and *M. raptorellis* effective in NE
- Purchase and/or conserve (limit pesticide use)

Evaluate Program Regularly

- Effectiveness
  - speck or trap counts
  - complaints
- $





How Effective are Fly Parasites for Fly Control on Maine Poultry and Dairy Farms?

Released Fly Parasites Weekly in Barns and Calf Hutches

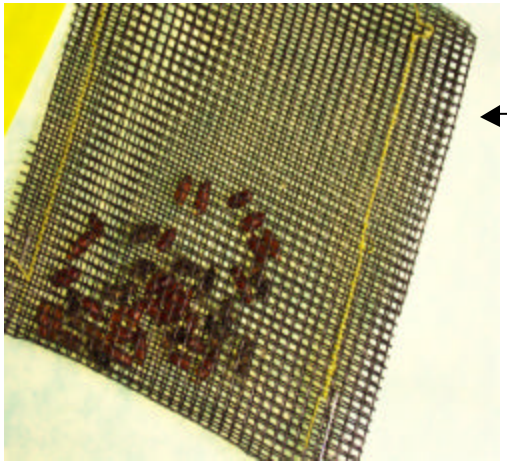
House Fly Biocontrol Demo 2001

- 4 organic dairy farms
  - 6 barms (fly parasites released in 5 barns)
- 200 parasites/cow or 1000/hutch weekly
- 12 weeks, beginning early June
- Monitored fly activity (speck counts on tapes replaced weekly)
- Monitored parasite effectiveness (sentinel pupae)

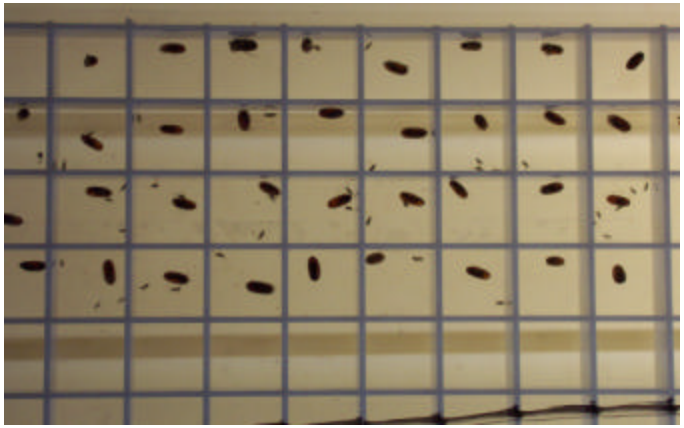
Placing Sentinel Fly Pupae to Estimate Parasitism Rate

Masking Tape Strips used to Monitor Fly Activity

Monitoring Effectiveness of Fly Parasites

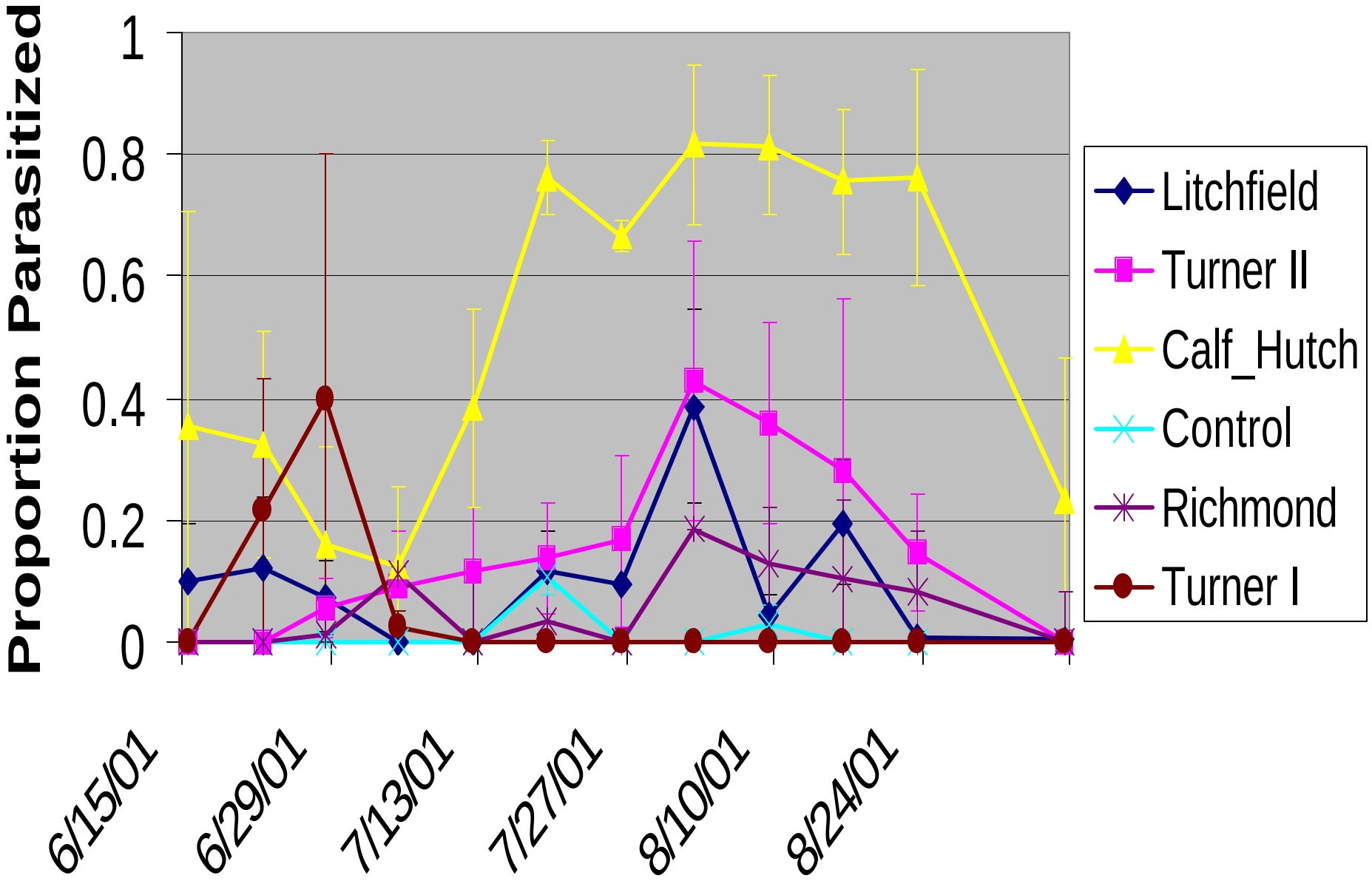


Sentinel Bag of Fly Pupae for Estimating Parasitism in Barns



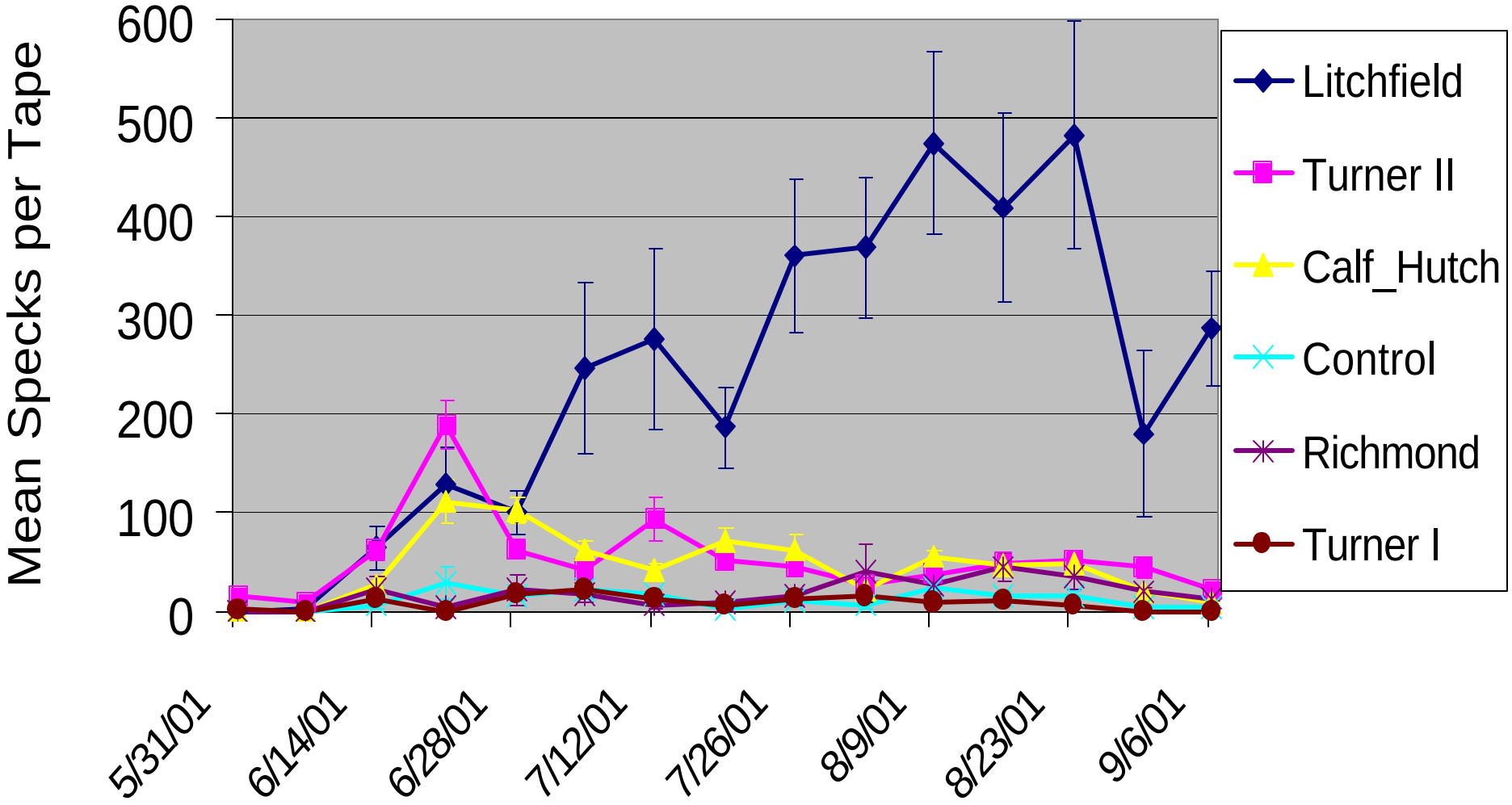
Parasites Emerging from Fly Pupae

Parasite Effectiveness on ME Dairy Farms, 2001



Parasite Release ME Dairy 2001

Fly Activity

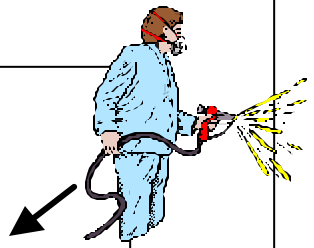


IPM vs Conventional Fly Control Demonstration

Dorothy Egg Farm-1999

Conventional Program

- •Insecticides:
  - •pyrethrin space sprays when needed
  - •90 bait stations
- •Weekly manure cleanout



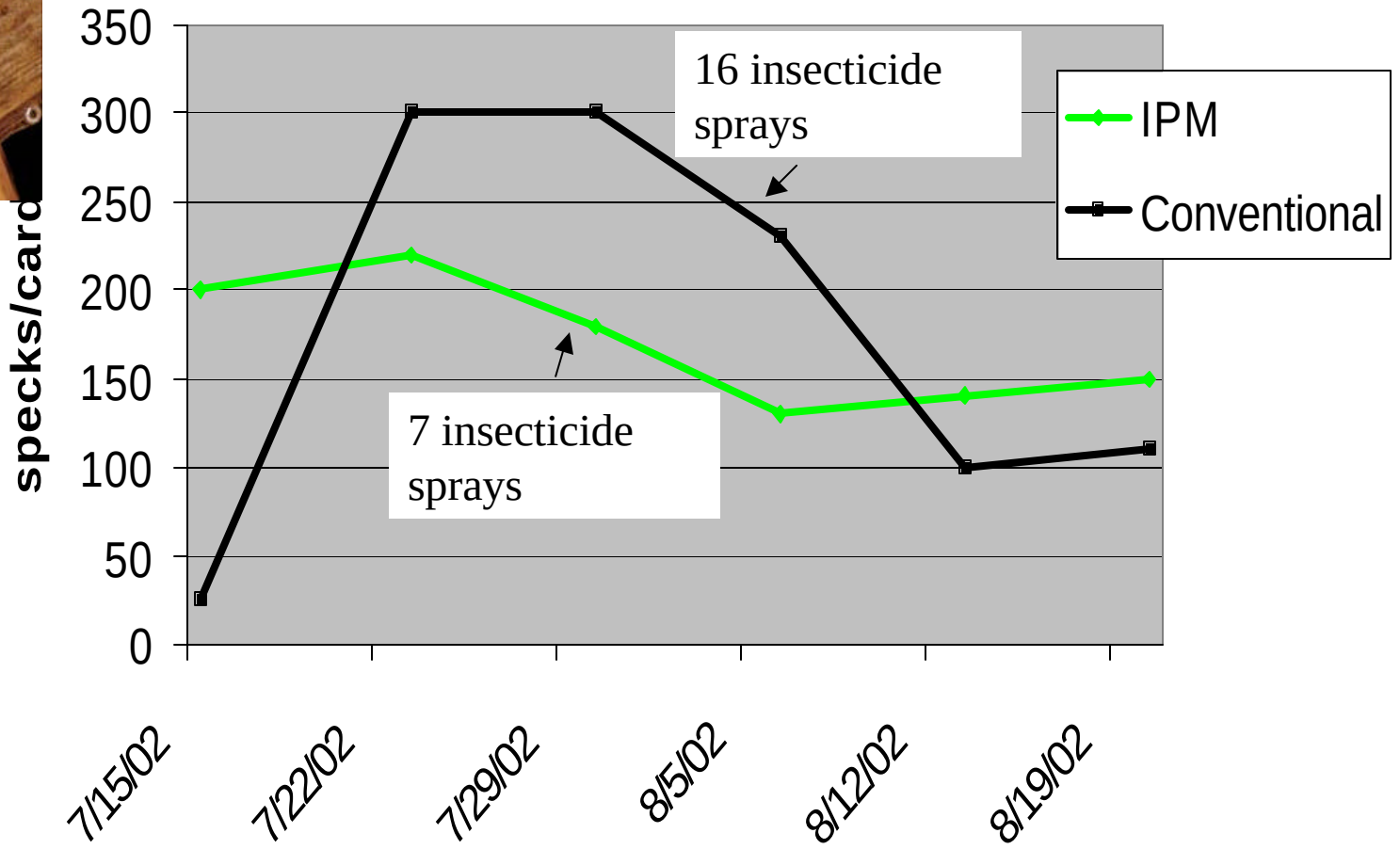
Bait Station

IPM Program

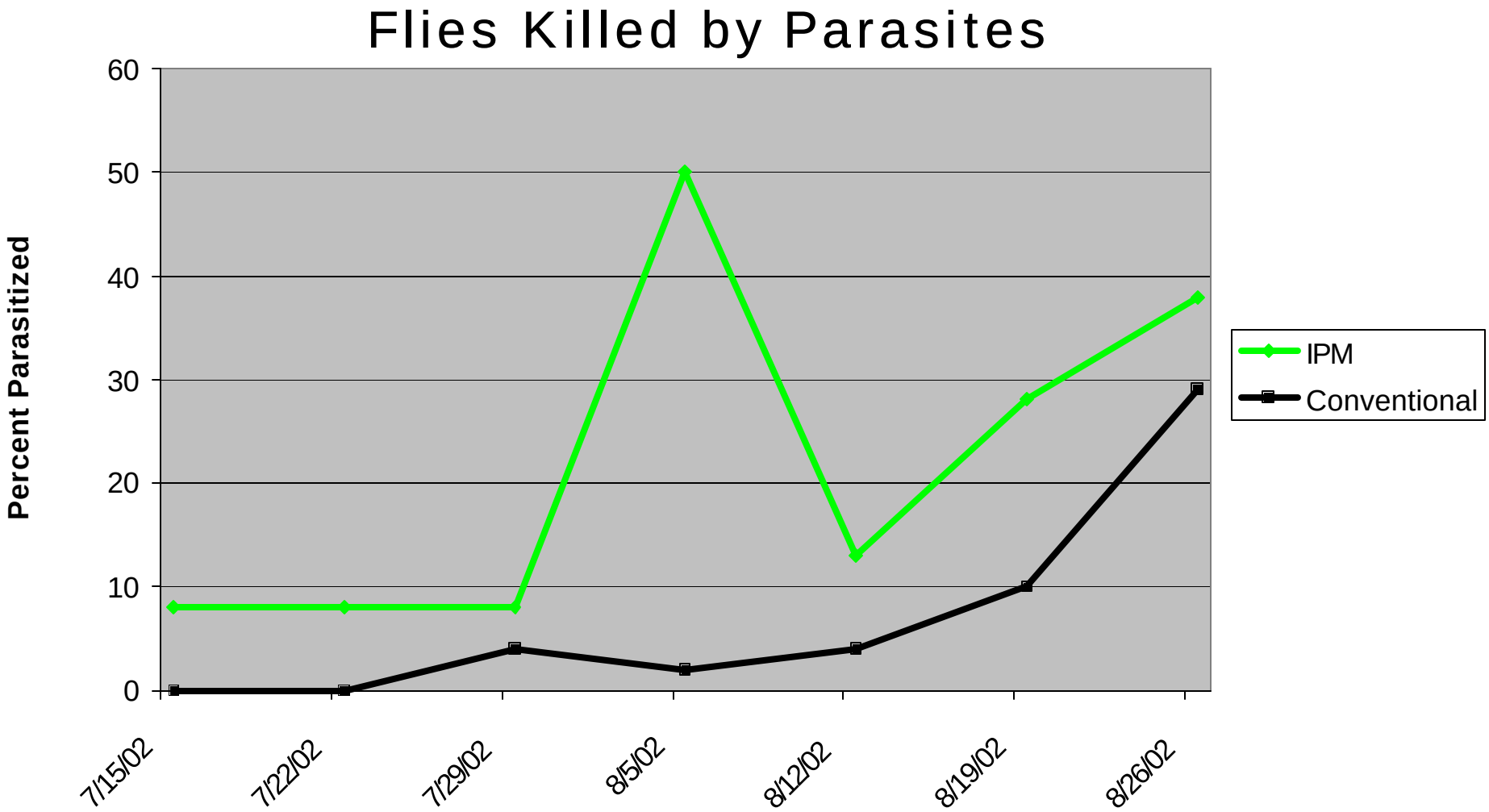
- •Insecticides:
  - • pyrethrin space sprays when needed
  - •25 bait stations
- •Fly parasites
  - •1 wasp per 2 birds
  - •Weekly for 10 wks

IPM vs. Conventional Fly Control Programs in Caged Layer Poultry

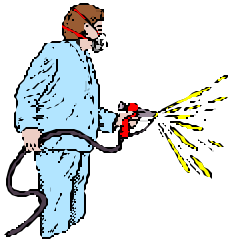
Winthrop, ME 1999



IPM vs Conventional Fly Control Program
Caged Layer Poultry 1999



Cost Comparison (10 wks)



Conventional

Sprays: $800

Baits: $125

Manure removal: $800

Total: **$1725**

IPM

Sprays: $350

Baits: $ 35

Fly Parasites: $500

Total: **$885**

Tips for Using Fly Parasites

- Buy from reputable company
- Monitor parasite viability (put sample in jar, after 7 days, count number wasps emerging per fly pupa.)
- Buy strains adapted to NE
- Species
  - Dairy: *Muscidifurax raptor*
  - Caged Layers: mixture of *M. raptor* ($\geq$ 50%) + *M. raptorellis*
- Keep parasites at 50-80^{o} F.
- Sprinkle parasites in protected fly breeding areas
- Release weekly for 4-12 weeks beginning April (caged layers) or mid-May (dairy).
- 2-4 parasites/bird, 200 per cow, 1000 per calf hutch per week.
- Monitor fly activity and keep records (speck counts, pesticides, parasite releases).

Summary

- **Use** knowledge about pests and natural enemies to **your** advantage
- Focus on prevention - keep barns clean and dry
- Use multiple tactics
- Conserve (limit pesticides) or release natural enemies
- Monitor fly activity and keep records